

What is the Condition of the Nation's Waters? Answering the 'big' question and more...

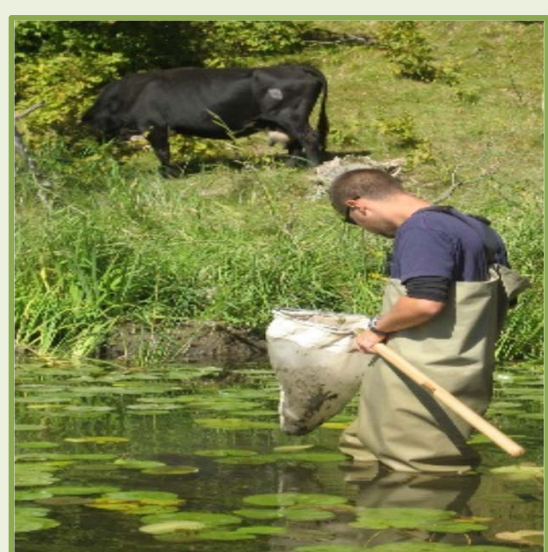


National Aquatic Resource
Surveys: An EPA, State and
Tribal Partnership



The National Aquatic Resource Surveys (NARS) are a series of comprehensive, statistically-based studies of U.S. waters. Designed to address a lack of information on national and large-scale water quality questions, the NARS are providing national and regional assessments of water quality, key stressors, and changes over time.

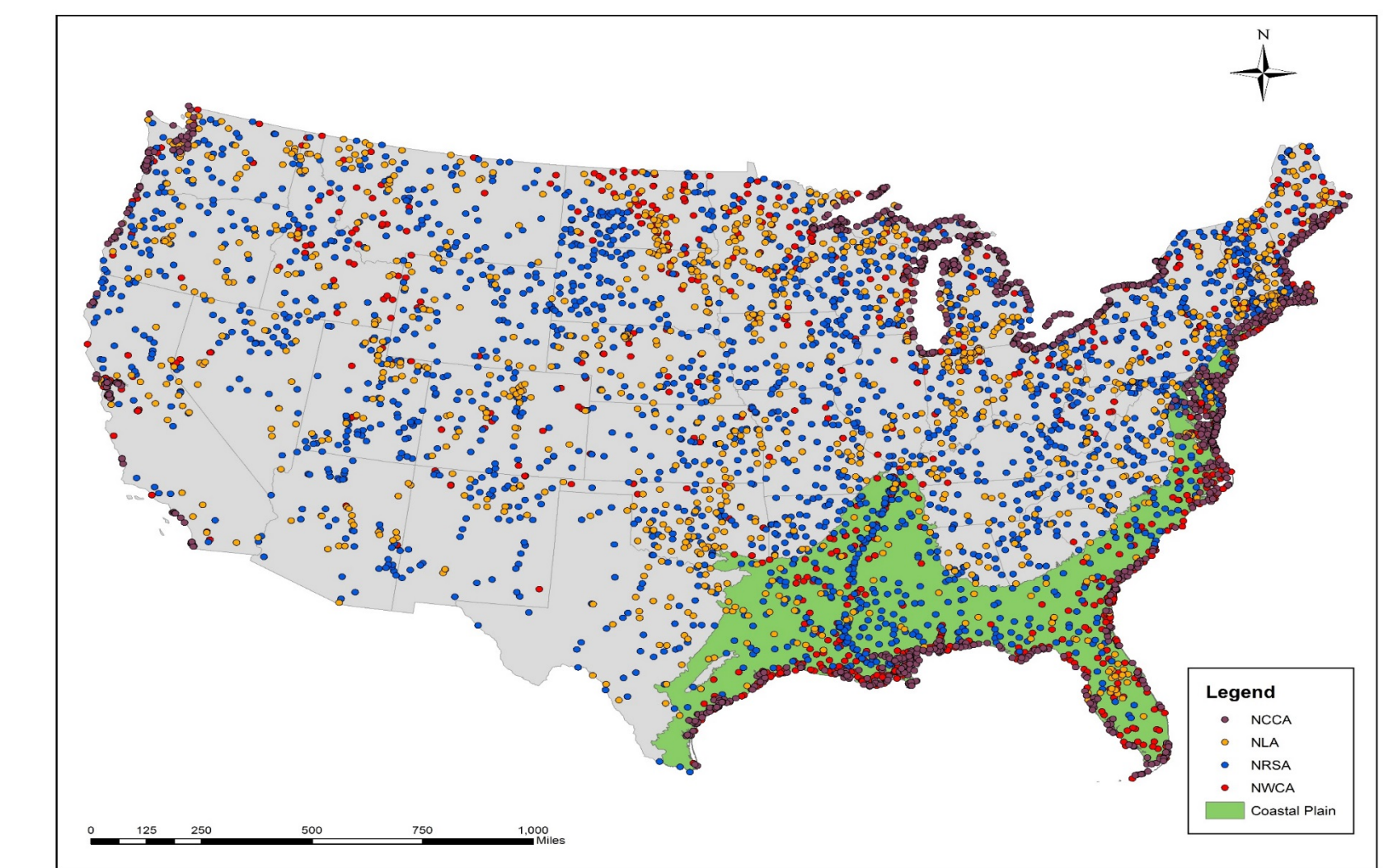
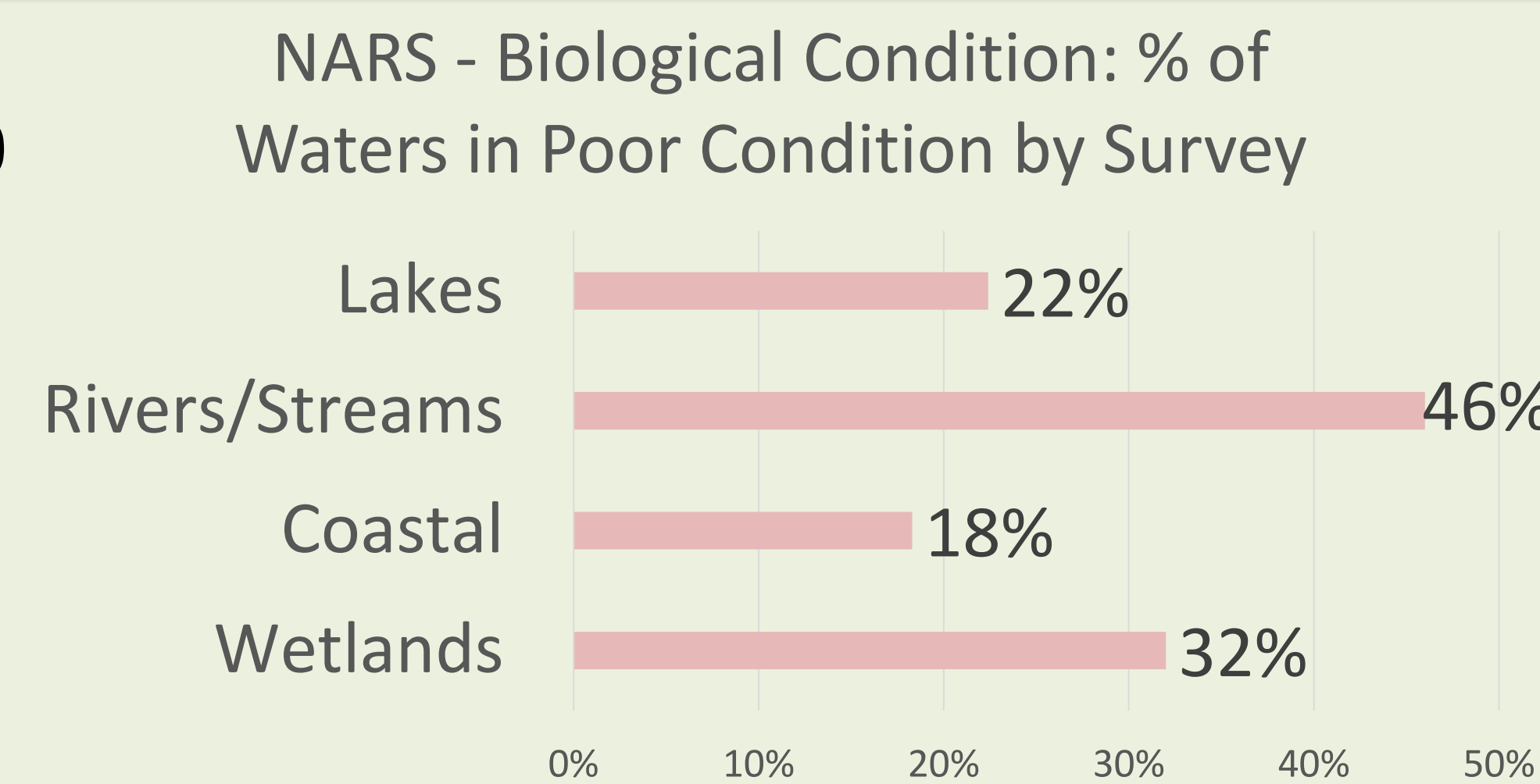
National Assessments



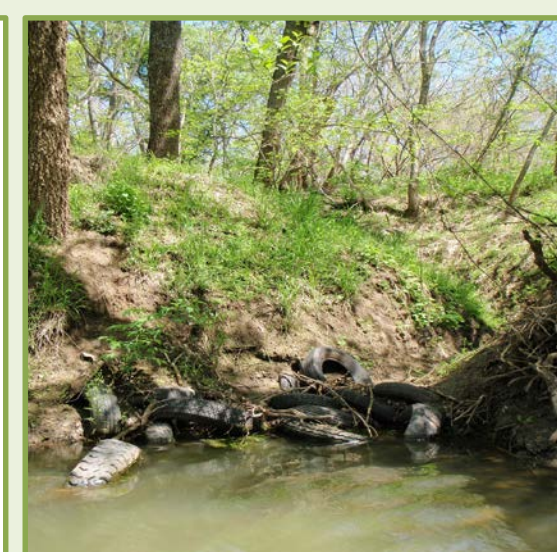
**What is the
biological
condition of our
nation's waters?**

Poor biological conditions persist in nearly 20 to 50% of U.S. waters.

- Rivers and streams have the largest percentage of waters in poor condition -- 46%; while coastal waters have the fewest at 18%.



**What are key
stressors causing
problems?**



Nutrient pollution and habitat degradation are problems across waterbody types.

- Waters with excess phosphorus range from 18% of lake to 46% of river/stream miles.
- More than 25% of inland waters are impacted by poor habitat.

Poor biological condition is:

- ~ 2X as likely in rivers/streams with high nutrients;
- ~ 2X as likely in wetlands when levels of vegetation removal or hardening are high; and
- 2-3X as likely when habitat is poor or nutrients are high in lakes.

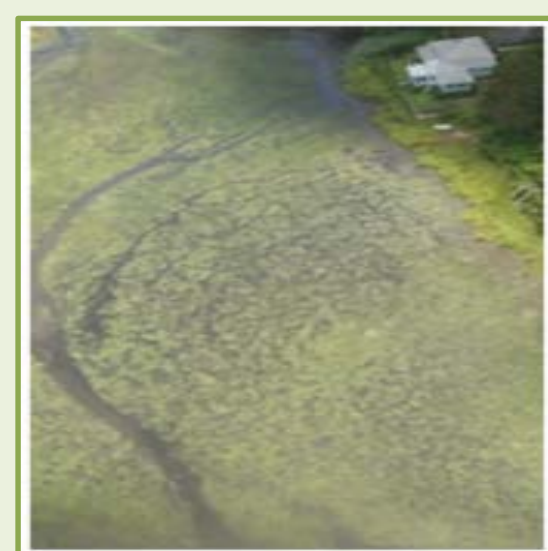
Examples of widespread stressors
% of waters in poor condition

Phosphorus

- Rivers/streams: 46%
- Coastal : 21%
- Lakes: 18%

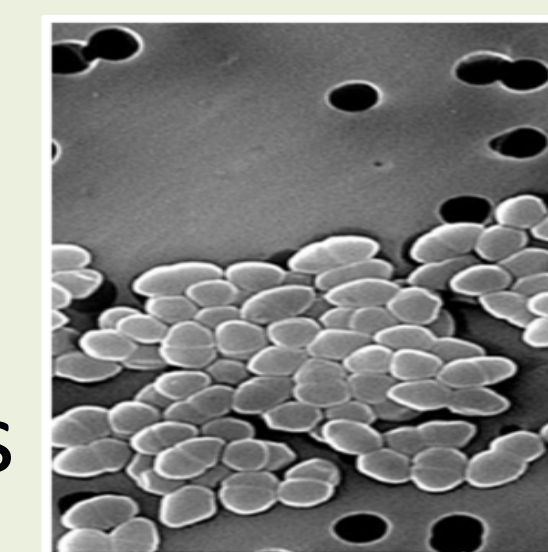
Habitat-Related

- Lakeshore habitat: 36%
- Wetland vegetation removal: 27%
- Rivers/streams riparian veg. cover: 24%



**What about
recreational/
public health
indicators?**

Microcystins, a direct measure of an algal toxin, are detected in our waters but not generally at levels of concern. They were detected in 33% of lake and 12% of wetland area; however, they were at levels of concern in <1%.

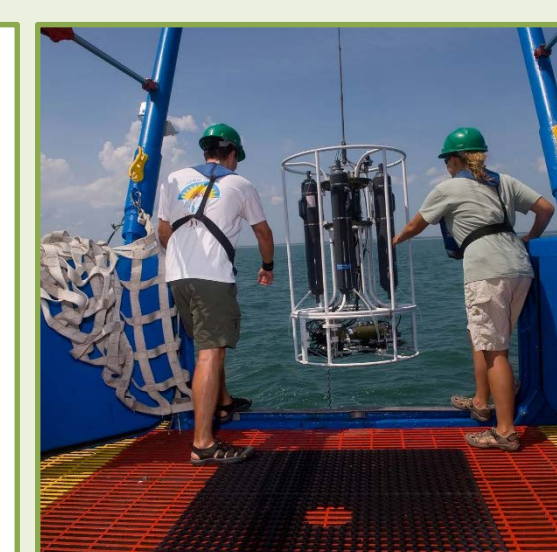


Enterococci, an indicator of the possible presence of disease-causing bacteria, is found at levels exceeding a human health threshold in 4% of lake and 23% of river and stream miles.

Compared to 2004 findings, the NARS found more streams rated good for two habitat indicators, and fewer rated good for biological condition and phosphorus.

Compared to coastal surveys in the early 2000s, the NCCA shows improvement in coastal biological condition and a decline in sediment quality.

**How are
conditions
changing?**



Change in
stream
condition

- Biological: 9% ↓
- Phosphorus: 14% ↓
- Riparian Veg.: 10% ↑
- Riparian Dist.: 12% ↑

Changes in
coastal
condition

- Biological – 17% ↑
- Sediment – 22% ↓

More research on
nutrients

Information presented here is from the National Lakes Assessment 2007, National Rivers and Streams Assessment 2008-2009, National Coastal Condition Assessment 2010, and the National Wetlands Condition Assessment 2011.

For more information on NARS see <https://www.epa.gov/national-aquatic-resource-surveys>

Data from the surveys can be accessed at

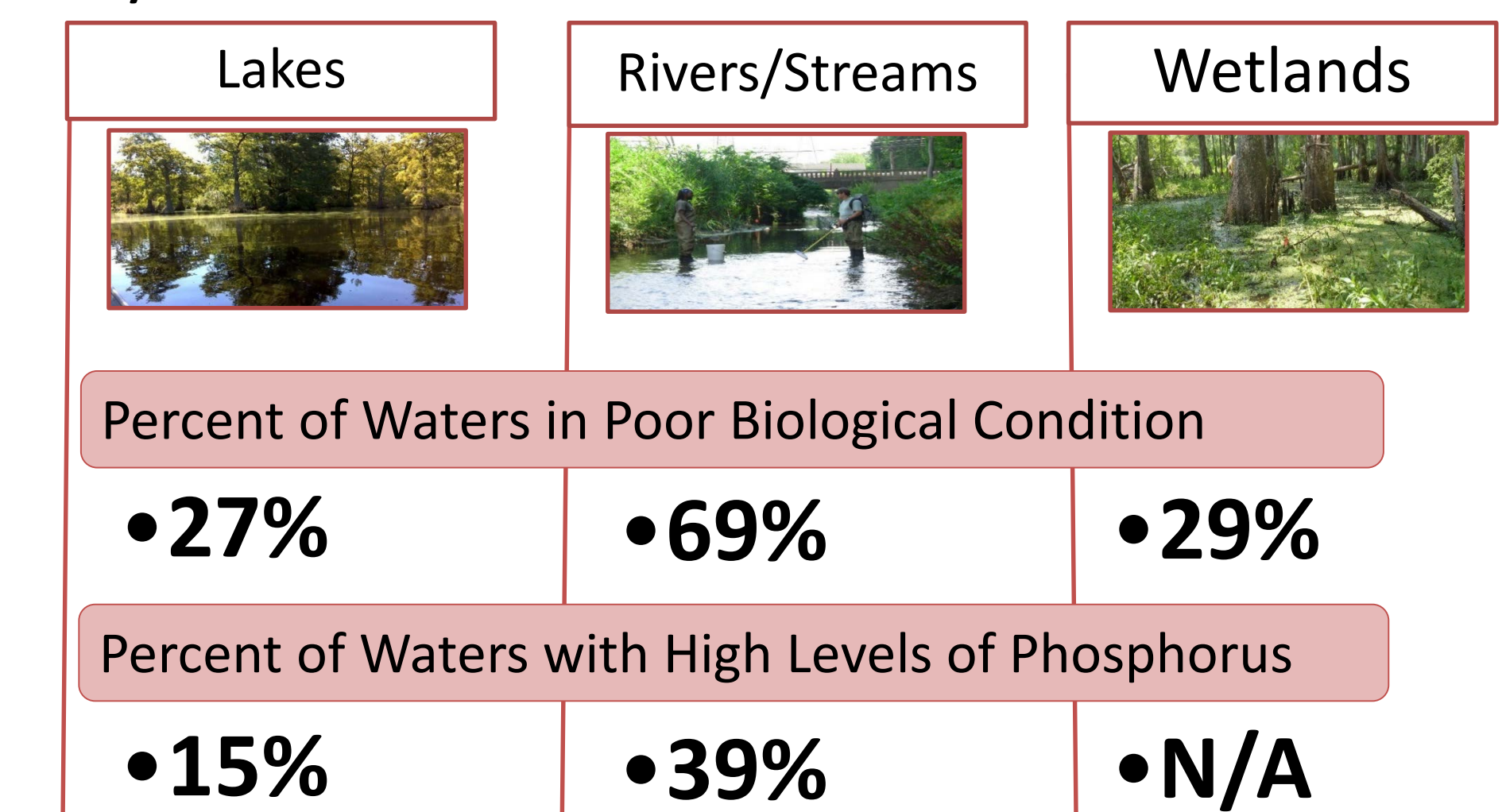
<https://www.epa.gov/national-aquatic-resource-surveys/data-national-aquatic-resource-surveys>

- National estimates are approximately +/-5%
- Biological Condition is assessed using different indicators for the waterbody types: Lakes - plankton; rivers/streams and coastal - benthics; wetlands - plants

Thank you to our many EPA partners - States and Tribes, USGS, NRCS, and other federal agencies, university and other cooperators, and all NARS field crews. Thank you also to the authors of the ES&T paper cited above for their work assessing changes in nutrient concentrations. Thank you to Brian Hasty, Michelle Maier, Colleen Mason, Alice Mayo and Marla Smith for your review and comments on this poster. Contact: Sarah Lehmann, US EPA. lehmann.sarah@epa.gov; 202 566-1379

Ecoregional Assessment: Coastal Plains

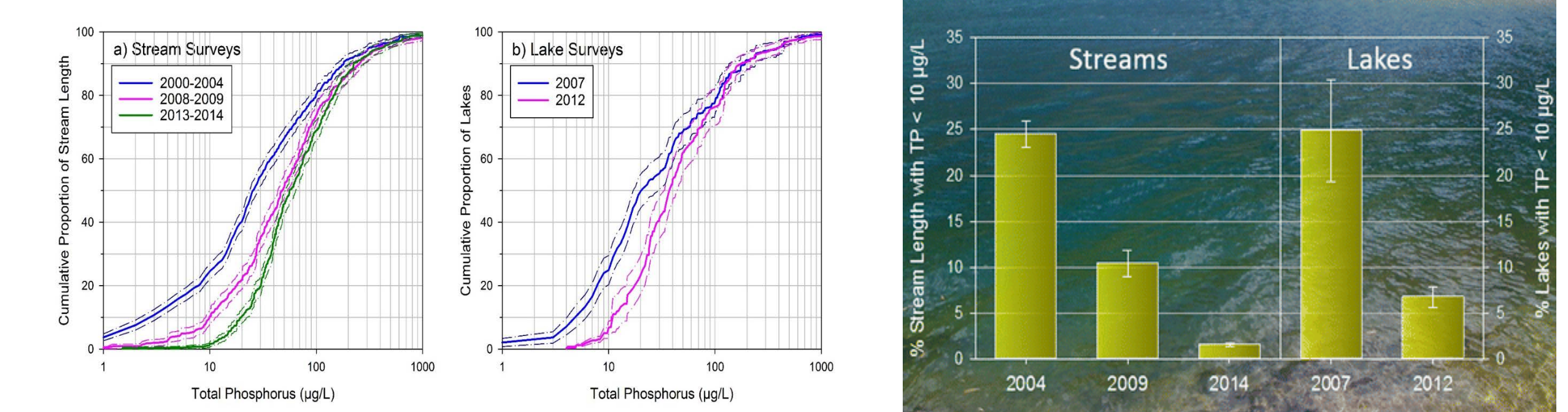
The example below shows ecoregional information from three NARS surveys for the Coastal Plains ecoregion, which covers the Miss. Delta and Gulf Coast, north along the Miss. River to the Ohio River, all of Florida, eastern Texas, and the Atlantic seaboard from Florida to New Jersey.



Ecoregional estimates are approximately +/-10-15%.

Continental-Scale Increase in Lake and Stream Phosphorus: Are Oligotrophic Systems Disappearing in the United States?

Using data from NARS, recent analysis by Stoddard, et al. describes increases in lake and stream total phosphorus (TP) concentrations observed between 2000–2014. The increases were most notable in sites where TP was initially low - less than 10 $\mu\text{g L}^{-1}$.



The authors note that “Increasing TP concentrations appear to be ubiquitous, but their presence in undeveloped catchments suggests that they cannot be entirely attributed to either point or common non-point sources of TP.”

***Continental-Scale Increase in Lake and Stream Phosphorus: Are Oligotrophic Systems Disappearing in the United States?** John L. Stoddard, John Van Sickle, Alan T. Herlihy, Janice Brahney, Steven Paulsen, David V. Peck, Richard Mitchell, and Amina I. Pollard. *Environmental Science & Technology*. 2016 50 (7), 3409-3415 .DOI: 10.1021/acs.est.5b05950.